Listing of Claims

Claim 1 (currently amended) A method for determining an offered load estimate for each of a plurality of bins corresponding to geographic regions of a cellular wireless territory for an operating cellular wireless system wherein a plurality of base transceiver stations (BTS's) service the territory, said method comprising the steps of:

computing for each of the plurality of bins a probability of each BTS serving a bin, and

solving an equitable resource allocation model to determine the bin offered load estimates based on inputs comprising offered load estimates for each of the plurality of BTS's, demand targets for each of the plurality of bins, and the computed probabilities, the equitable resource allocations model comprising a plurality of resource constraints and an objective function wherein the resource constraints are expressions describing relations between the computed probabilities, the BTS offered load estimates, and the bin offered load estimates and wherein the objective function is an expression describing relations between the bin target demands and the bin offered load estimates.

Claim 2 (canceled)

Claim 3 (currently amended) ~~The~~ A method ~~of claim 2 wherein~~ for determining an offered load estimate for each of a plurality of bins corresponding to geographic regions of a cellular wireless territory wherein a plurality of base transceiver stations (BTS's) service the territory, said method comprising the steps of:

computing for each of the plurality of bins a probability of each BTS serving a bin, said computing step comprising the probabilities being based on probability distribution function of signal strengths and said probabilities are of the form of equation (1), and

solving an equitable resource allocation model to determine the bin offered load estimates based on inputs comprising offered load estimates for each of the plurality of BTS's, demand targets for each of the plurality of bins, and the computed probabilities, the equitable resource allocation model comprising a plurality of resource constraints and an objective function wherein the resource constraints are expressions describing relations between computed probabilities, the BTS offered load estimates, and the bin offered load estimates and wherein the objective function is an expression describing relations between the bin demand targets and the bin offered load estimates.

Claim 4 (currently amended) ~~The~~ A method ~~of claim 2 wherein~~ for determining an offered load estimate for each of a plurality of bins corresponding to geographic regions of a cellular wireless territory wherein a plurality of base transceiver stations (BTS's) service the territory, said method comprising the steps of:

computing for each of the plurality of bins a probability of each BTS serving a bin, said probability computing step computing the probabilities based on probability function of signal strengths and wherein said probabilities are of the form of equation (3), and

solving an equitable resource allocation model to determine the bin offered load estimates based on inputs comprising offered load estimates for each of the plurality of BTS's, demand targets for each of the plurality of bins, and the computed probabilities, the equitable resource allocation model comprising a plurality of resource constraints and an objective function wherein the resource constraints are expressions describing relations between the computed probabilities, the BTS offered load estimates, and the bin offered load estimates and wherein the objective function is an expression describing relations between the bin demand targets and the bin offered load estimates.

Claim 5 (currently amended) The method of claim 1 wherein each BTS's offered load estimate is based on the BTS's operating carried load and lost calls.

Claim 6 (currently amended) ~~The~~ A method ~~of claim 1~~ for determining an offered load estimate for each of a plurality of bins corresponding to geographic regions of a cellular wireless territory wherein a plurality of base transceiver stations (BTS's) service the territory, said method comprising the steps of:

computing for each of the plurality of bins a probability of each BTS serving a bin, and

solving an equitable resource allocation model to determine the bin offered load estimates based on inputs comprising offered load estimates for each of the plurality of BTS's, demand targets for each of the plurality of bins, and the computed probabilities, the equitable resource allocation model comprising a plurality of resource constraints and an objective function wherein the resource constraints are expressions describing relations between the computed probabilities, the BTS offered load estimates, and the bin offered load estimates and wherein the objective function is an expression describing relations between the bin demand targets and the bin offered load estimates, and

wherein each of the plurality of resource constraints corresponds to a BTS and indicates that a computed offered load for that BTS cannot exceed that BTS's estimated offered load wherein the computed offered load is given by equation (4).

Claim 7 (original) The method of claim 1, further comprising the steps of:

receiving as inputs relative demand approximations for cellular service at each of the plurality of bins and converting the demand approximations to the demand targets such that the sum of the demand targets for the plurality of bins equals the sum of the BTS offered load estimates for the plurality of BTS's.

Claim 8 (original) The method of claim 1 wherein the objective function is a vector of non-increasing performance functions wherein each performance function corresponds to a bin and is a weighted normalized deviation between the bin's demand target and the bin's offered load estimate.

Claim 9 (currently amended) The method of claim ~~8~~ 1 wherein ~~the~~ each determined bin offered load ~~estimates~~ estimate is the solution of the ~~generated~~ equitable resource allocation model in the form of equations (10a), (10b), and (10c) and which ~~result~~ results in a ~~lexographic~~ lexicographic smallest vector of performance functions, sorted in ~~an~~ a non-increasing order, and ~~satisfy~~ satisfies the plurality of resource constraints.

Claim 10 (original) The method of claim 1 further comprising the steps of:

using the determined bin offered load estimates to identify bins with relative high offered load estimates, and

using the identified bins to improve service to these bins.

Claim 11 (original) The method of claim 1 further comprising using the determined bin offered load estimates to perform load balancing among the BTS's.

Claim 12 –15 (canceled)

Claim 16 (currently amended) ~~The~~ A method ~~of claim 12 wherein~~ for determining weights to be used for performing frequency assignment among a plurality of base transceiver stations (BTS's) of a cellular territory, each BTS having an offered load estimate, and wherein the territory is divided into a plurality of logical bins each having a demand target and the plurality of bins further having probabilities of being served by each BTS, said method comprising the steps of:

determining an offered load estimate for each of the plurality of bins by solving an equitable resource allocation model, said equitable allocation resource model comprising a plurality of resource constraints and an objective function, the resource constraints expressing relations between the probabilities of each bin being served by each BTS, the BTS offered load estimates, and the bin offered load estimates and each of the plurality of resource constraints ~~corresponds~~ corresponding to a BTS and ~~indicates~~ indicating that a computed offered load can not exceed the BTS's estimated load and wherein the computed offered load is given by equation (4), and the objective function expressing relations between the bin demand targets and the bin offered load estimates, and

using the determined bin offered load estimates as weights to perform frequency assignment among the BTS's.

Claim 17 (currently amended) ~~The~~ A method ~~of claim 12~~ for determining weights to be used for performing frequency assignment among a plurality of base transceiver stations

(BTS's) of a cellular wireless territory, each BTS having an offered load estimate, and wherein the territory is divided into a plurality of logical bins each having a demand target and the plurality of bins each further having probabilities of being served by each BTS, said method comprising the steps of:

determining an offered load estimate for each of the plurality of bins by solving an equitable resource allocation model, said equitable resource model comprising a plurality of resource constraints and an objective function, the resource constraints expressing relations between the probabilities of each bin being served by each BTS, the BTS offered load estimates, and the bin offered load estimates, and the objective function expressing relations between the bin demand targets and the bin offered estimates, and

using the determined bin offered load estimates as weights to perform frequency assignment among the BTS's, and

wherein the objective function is a ~~lexographic~~ lexicographic minimax objective function of a vector performance functions wherein each performance function corresponds to a bin and is a weighted normalized deviation between the bin's demand target and the bin's offered load estimate and wherein the determined bin offered load estimates simultaneously produce the ~~lexographic~~ lexicographic smallest vector of performance functions sorted in non-increasing order and satisfy the plurality of resource constraints.

Claims 18-21 (canceled)

Claim 22 (new) The method of claim 1 wherein said probability computing step computes the probabilities considering that the strongest received BTS signal in a given bin serves a mobile station in that bin in accordance with equation (1) wherein this equation uses the signal strength probability at every bin from every bin.

Claim 23 (new) The method of claim 1 wherein said probability computing step computes the probabilities considering that one or more strongest received BTS signals in a given bin serve a mobile station in that bin in accordance with equations (2a), (2b) and (3) wherein these equations use the signal strength probability at every bin from every bin.

Claim 24 (new) The method of claim 1 further comprising the step of using the determined bin offered load estimates to determine weights to be used in performing frequency assignment among a plurality of BTS's of a cellular wireless territory.

Claim 25 (new) The method of claim 6 wherein said resource constraints are given by equation (5).